Synopsis of Original Research Paper

Studies on the safety assessment of the cosmetic compound as an index of the damage of ocular membrane : evelopment of quantitative assessment of drug behaviour in the eye

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The eye contains several different structures with specific physiological functions. The eye also has protective mechanisms for serving its primary function of ensuring proper vision which are responsible for cleaning the outside and inside of the eye and for eliminating foreign matter. These protective mechanisms include solution drainage, lacrimation, drug absorption via the vascularized conjunctiva, corneal barrier, melanin binding, aqueous humor flow, and the blood-eye barrier. Although protective, these mechanisms also disturb the ocular delivery and decrease the bioavailability of ophthalmic drugs. The availability and pharmacokinetics of instilled drugs in the eye is mainly controlled by three factors : (1) disposition of drugs in precorneal area, (2) the permeability of cornea, and (3) elimination of drugs from the eye.

Generally, topical application of drugs is the method of choice under most circumstances because of its convenience and safety for ophthalmic chemotherapy. However, upon instillation of an ophthalmic drug, most of it is rapidly eliminated from the precorneal area due to drainage by the naso-lacrimal duct and dilution by tear turnover ; this is readily absorbed into the systemic circulation. To be effective, most of the drug also should penetrate the tight barrier of the corneal epithelium into the inside of the eye. Such behaviour can result in poor bioavailability and increased severity in a systemic adverse effects from topically applied drugs.

The purpose of this study was to develop the quantitative assessment of drug behaviour in the eye for the safety assessment of the cosmetic compound as an index of the damage of ocular membrane. Therefore, the penetration of drugs was measured across the isolated corneal and conjunctival membranes of the albino rabbit using a two-chamber glass diffusion cell. In summary, the conjunctival and cornea of the rabbit eye are sufficiently different in permeation character to control the extent and pathway for ocular absorption of drugs.